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GGSIPU Chemistry 2005

1. The standard e.m.f.for the cell reaction, $2Cu^{+}_{(aq)} \rightarrow Cu_{(s)} + Cu^{2+}_{(aq)}$ is +0.36 V at 298 K.The equilibrium constant of the reaction is :

(a) $5x10^{6}$ (b) $1.4x10^{12}$

(c) $7.4x10^{12}$ (d) $1.2x10^{6}$

2. The standard e.m.f of the cell ,Cd(s) ^{0} $CdCL_2$(aq) (0.1 M) $^{0\,0}$ AgCL(s) ^{0} Ag(s) in which the cell reaction is :

$Cd(s)+2AgCL(s) \rightarrow 2Ag(s)+Cd^{2+}(aq)+2CL^{-}(aq)$

Is 0.6915 V at 0^{0} C and 0.6753 V at 25^{0} C.The enthalpy change of the reaction at 25^{0} C.The enthalpy change of the reaction at 25^{0} C is :

(a) -176 kJ (b) -234.7 kJ

(c) +123.5 kJ (d) -167.26 kJ

3. Which of the following statement is true ?

(a) The relative lowering of vapour pressure of a solution is equal to the mole fraction of the solute present in the solution.

(b) Passage of solute molecules towards solution side through semipereable membrance is osmosis.

(c) The boiling point of a solution is always lower than the solvent

(d) The boiling point of a liquid is the temperature at which its vapour becomes equal to 260 mm

4. The deviation from the ideal gas behavior of a gas can be expressed as :

(a) $Z=\frac{P}{VRT}$ (b) $Z=\frac{PV}{nRT}$

(c) $Z=\frac{nRT}{PV}$ (d) $Z=\frac{VR}{PT}$

5. Which of the following statement is not true ?

(a) The pressure of a gas is due to collision of the gas molecules with the walls of the container

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(b) The molecular velocity of any gas is proportional to the square root of the absolute temperature

(c) The rate of diffusion of a gas directly proportional to the density of the gas at constant pressure

(d) Kinetic energy of an ideal gas is directly proportional to the absolute temperature

6. The unit of second order reaction rate constant is :

(a) $L^{-1}.mol.s^{-1}$

(b) $L^{2}.mol^{-2}.s^{-1}$

(c) $L.mol^{-1}.s^{-1}$

(d) s^{-1}

7. Hess' law states that :

(a) the standard enthalpy of an overall reaction is the sum of the enthalpy changes in individual reactions

(b) enthalpy of formation of a compound is same as the enthalpy of decomposition of the compound into constituent elements,but with opposite sign

(c) at constant temperature the pressure of a gas is inversely proportional its volume

(d) the mass of a gas dissolved per litre of a solvent is proportional to the pressure of the gas in equilibrium with the solution

8. The half-life of a reaction is halved as the initial concentration of the reactant is doubled.The order of the reaction is :

(a) 0.5 (b) 1

(c) 2 (d) 0

9. One gram of (A) decays by -emission to 0.125 g in 200 years.The half life period of the reaction is :

(a) 0.014 years (b) 6.66 years

(c) 66.6 years (d) 666 years

10. Isotopes are :

(a) atoms of different elements having same mass number

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(b) atoms of same elements having same mass number

(c) atoms of same element having different mass number

(d) atoms of different element having same number of neutrons

11. Acid hydrolysis of sucrose is a :

(a) pseudo first order reaction

(b) zero order reaction

(c) second order reaction

(d) unimolecular reaction

12. The product obtained after posirtron emission from $31^{GA^{68}}$ is :

(a) $30^{GA^{68}}$ (b) $30^{Zn^{68}}$

(c) $31^{Zn^{69}}$ (d) $31^{Ga^{69}}$

13. The relationship between coefficient of viscosity of a liquid and temperature can be expressed as :

(a) ¦ = Ae^{ERT} (b) ¦ = $Ae^{E/RT}$

(c) ¦ = ET/R (d) ¦ = $Ae^{RT/E}$

14. An aqueous solution in which the H^+ ion concentration is greater than 10^{-7} M is said to be :

(a) acidic (b) alkaline

(c) neutral (d) none of these

15. In the hydrolysis of a salt of weak acid and weak base ,the hydrolysis constant K_h is equal to :

(a) $\frac{K_w}{K_b}$ (b) $\frac{K_w}{K_a}$

(c) $\frac{K_w}{K_a x K_b}$ (d) $K_a x K_b$

16. In the following reaction, AgCL+KI ⇌ KCL+AgI as KI is added,the equilibrium is shifted towards right giving more AgI precipitat,because :

(a) both AgCL and AgI are sparingly soluble

(b) the K_{sp} of AgI is lower than K_{sp} of AgCL

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(c) the K_{sp} of AgI is higher than K_{sp} of AgCL

(d) bothAgCL and AgI have same solubility product

17. In the nuclear reaction ;

$$13^{AL^{27}} + 2^{He^4} \rightarrow 14^{X^{30}} + 1^{H^1}, \text{x is :}$$

(a) Si (b) AL (c) Mg (d) P

18. What kind of molecule $ALCL_3$ is ?

(a) Bronsted acid (b) Lewis acid

(c) Lewis base (d) Bronsted base

19. How much $K_2Cr_2O_7$ (molecular weight = 294.19) is required to prepare one litre of 0.1 N olution ?

(a) 9.8063 g (b) 7.3548 g

(c) 3.6774 g (d) 4.903 g

20. The ionic strength of a solution containing 0.1 mol/kg of KCL and o.2 mol/kg of $CuSO_4$ is :

(a) 0.3 (b) 0.6 (c) 0.9 (d) 0.2

21. A gas can expend from 100 mL to 250 mL under a constant pressure of 2 atm.The work done by gas is :

(a) 30.38 joule (b) 25 joule

(c) 5 k Joule (d) 16 joule

22. If the r.m.s speed of gaseous molecule is xm/sec at a pressure P atm,then what will be the r.m.s speed at a pressure 2P atm and constant temperature ?

(a) x (b) 2x (c) 4x (d) x/4

23. Ionic mobility of Ag^+ Is ($^a_{Ag^+}$=5X10^{-1} ohm^{-1} cm^2 eq^{-1}):

(a) 5.2X10^{-9} (b) 2.4X10^{-9}

(c) 1.52X10^{-9} (d) 8.25X10^{-9}

24. Which of the following is the strongest acid ?

(a) HF (b) HCL (c) HBr (d) HI

25. What is the general outer electronic configuration of the coinage metal ?

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(a) $ns^2 np^6$ (b) $(n-1)d^{10} ns^1$

(b) $(n-1)d^{10} ns^2$ (d) $(n-1)d^9 ns^2$

26. How does the ionization energy of 1^{st} group elemeny vary?

(a) Increases down the group

(b) Decreases down the group

(c) Remains unchanged

(d) Variation is not regular

27. What I the oxidation number of cholrine in ClO_3^- ?

(a) +5 (b) +3 (c) +4 (d) +2

28. What type of hybridsation takes place in the N atom of NH_3 ?

(a) sp^2 (b) sp^3 (c) dsp^2 (d) sp

29. What is the co-ordination number of CL^- in a NaCL crystal ?

(a) 8 (b) 6 (c) 4 (d) 3

30. How many electrons are involved in oxidation of $KMnO_4$ in basic medium ?

(a) 1 (b) 2 (c) 5 (d) 3

31.The magnetic moment of $K_3[Fe(CN)_6]$ is found to be 1.7 BM.How many unpaired electron (s) is/are present per molecule ?

(a) 1 (b) 2 (c) 3 (d) 4

32. Which among the following is an electron deficient compound ?

(a) NF_3 (b) PF_3

(c) BF_3 (d) AsF_3

33. Arrange the hydra-acids of halogens in increasing order of acidity .

(a) HF<HCL<HBr<HI

(b) HI<HBr<HCL<HF

(c) HF<HBr<HI<HCL

(d) HF<HI<HBr<HCL

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34. What is the product of the reaction of H_2O_2 with CL_2 ?

(a) O_2 + HOCL (b) HCL + O_2

(c) H_2O + HCL (d) HCL + H_2

35. Which of the following organo-silicon compound on hydrolysis will give a three dimensional silicon ?

(a) R_3SiCL (b) $RSiCL_3$

(c) $SiCL_4$ (d) R_2SiCL_2

36. NaOCL is used as a bleching agent and sterilizing agent.It can be synthesized by the action of

(a) NaCL with H_2O

(b) NH_4CL with NAOH

(c) CL_2 with cold and delute NaOH

(d) Cl_2 with hot and concentrated NaOH

37. How can you synthesize nitric oxide in the liboratory ?

(a) Zinc with cold and delute HNO_3

(b) Zinc with concentrated HNO_3

(c) Copper with cold and delute HNO_3

(d) Heating NH_4NO_3

38. Which of the following does not have a lone pair on the central atom ?

(a) NH_3 (b) PH_3 (c) BF_3 (d) PCL_3

39. Which colourless gas evolves when NH_4CL reacts with Zinc in a dry cell battery ?

(a) NH_3 (b) N_2 (c) H_2 (d) CL_2

40. What is the nature of the bond between B and O in $(C_2H_5)_2OBH_3$?

(a) Covalent (b) Co-ordinate covalent

(c) Ionic bond (d) Banana shaped bond

41. An alkene gives two moles of HCHO,one mole of CO_2 and one mole of CH_3COCHO on ozonolysis.What is its structure ?

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(a) CH_2= C = CH J CH_2J CH_3

CH_3

0

(b) CH_2 = CH J CH J CH = CH_2

(c) CH_2 = C = C J CH_3

0

CH_3

CH_3

0

(d) CH_2 = C =C J CH = CH_2

42. IUPAC name of the compound,

CH_3

0

CH_3JCH2JCHJCH_2JCHJCH_2 JCH_2JCH_3

0

CH

CH_3 CH_3

(a) 4-isoprophyl,6-methyl octane
(b) 3-methyl,5-(1-methyl elthyl) octane
(c) 3-methyl,5 isoprophyl octane
(d) 6-methyl,4-(1-methylethyl) octane

43. The order of melting point of ortho,para,meta-nitrophenol is

(a) 0>m>p (b) p>m>o

(c) m>p>o (d) p>o>m

44. When $CHCL_3$ is boiled with NaOH,it gives :

(a) formic acid (b) trihydroxy methane

(c) acetylene (d) sodium formate

45. Which of the following is an example of ketohexose ?

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(a) Mannose (b) galactose

(c) Maltose (d) Fructose

46. When aniline is treated with sodium nitrite and hydrochloric acid at 0^0 C,it gives

(a) phenol and N_2

(b) diazonium salt

(c) hydrazo compound

(d) no reaction takes place

47. When benzoic acid is treated with PCL_5 at 100^0C,it gives :

(a) benzoyl chloride

(b) 0-chalorobenzoic acid

(c) p-chalorobenzoic acid

(d) benzyl chloride

48. The key step in Cannizaro's reaction is the intermolecular shift of :

(a) proton (b) hydride-ion

(c) hydronium ion (d) hydrogen bond

49. Aldehydes and ketones can be reduced to hydrocarbon by using :

(a) $LiALH_4$ (b) H_2/pd-$BaSO_4$

(c) Na-Hg/HCL (d) NH_2JNH_2/C_2H_5ONa

50. Cinnamic acid is formed when C_6H_5JCHO condenses with $(CH_3CO)_2O$ in presence of :

(a) concentrated H_2SO^4

(b) sodium acetate

(c) sodium metal

(d) anhydrous $ZnCL_2$

51. What is the product of the reaction of phenol with $CHCL_3$ in aqueous NaOH and subsequent and hydrolysis ?

(a) Salicylic acid (b) Salicylaldehyde

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(c) Benzoic acid (d) Benzaldehyde

52. On treatment with chlorine in presence of sunlight,tolune gives the product :

(a) o-choloro tolune

(b) 2,5-dichloro tolune

(c) p-chloro toluene

(d) benzyl chloride

53. Which of the following cycloalkane gives open chain compound,when reacts with bromine ?

(a) Cyclopropane (b) Cyclopentane

(c) Cyclohexane (d) Cyclooctane

54. Which of the following intermediate have the complete octate around the carbon atom ?

(a) Carbonium ion (b) Carbanion

(d) Free redial (d) Carbene

55. If the dipole moment of toluene and nitro-benzene are 0.43 D and 3.93 D,Then what is the expected dipole moment of P-nitro toluene ?

(a) 3.50 D (b) 2.18 D

(c) 4.36 D (d) 5.30 D

56. What is the product when 2-butyne is treated with liquid NH_3 in presence of lithium ?

(a) n-butane (b) cis-2 butene

(c) trans-2-butene (d) 1-butene

57. In the dichlorination reaction of propane,mixure of products are obtainedHow many isomers the mixture contains ?

(a) 2 (b) 3

(c) 4 (d) 5

58. Cyclopentadieny1 anion is :

(a) aromatic (b) non-aromatic

(c) non-planer (d) aliphatic

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59. What is the product of the reaction of 1,3-butadiene with Br_2 ?

(a) 1,4-dibromo butane

(b) 1,2 dibromo butane

(c) 3,4-dibromo butane

(d) 2,3-dibromo to butane

60. The most common type of reaction in aromatic compound is :

(a) elimination reaction

(b) addition reaction

(c) electrophilic substitution reaction

(b) rearrangement reacttion

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